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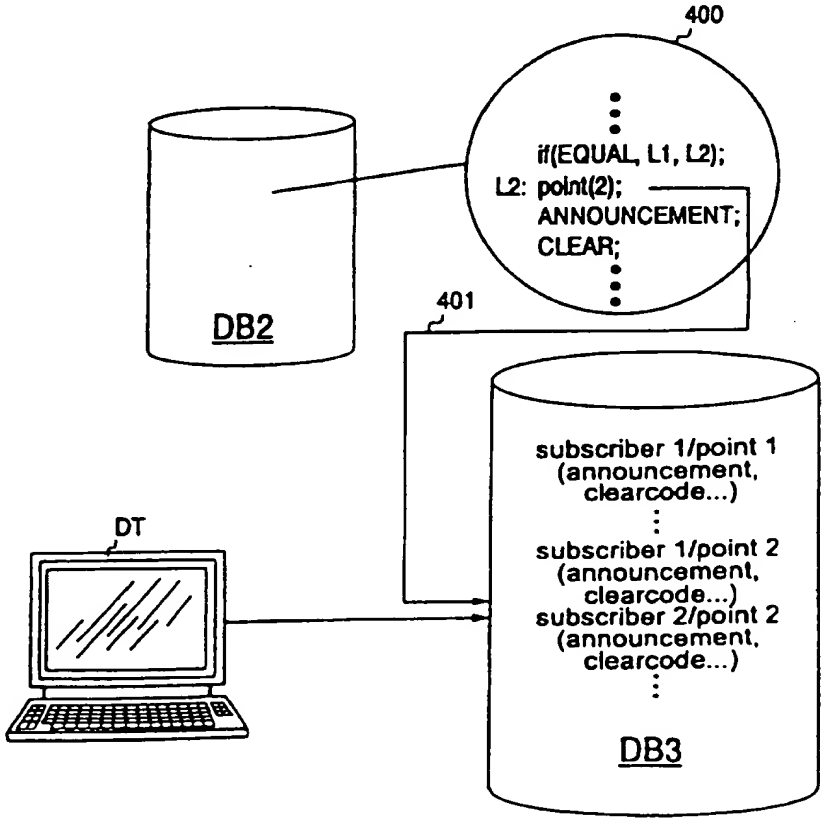
(57) Abstract

The invention relates to a method of providing a subscriber-specific service by an intelligent network. In the method, a service logic program is stored in a database (BD1, DB2) of the intelligent network and a subscriber-specific service is provided by starting said service logic program in response to a predefined trigger condition. In order that subscriber-specific services could be implemented economically on a really large scale, (a) the service logic program is implemented as a service logic program (400) common to a plurality of subscribers, (b) subscriber-specific information relating to the service is stored, for each subscriber, separately from said service logic program, and (c) in the service logic program there are defined points from which the program reads, during the execution, subscriber-specific information on an individual subscriber, whereby the execution of the common service logic program with the read subscriber-specific information provides said subscriber-specific service.



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Personal IN service

The invention relates to a method according to the preamble of attached claim 1 and a system according to the preamble of attached claim 4 for providing a subscriber-specific service by the use of an intelligent network.

In order to make it easier to understand the following description, we shall first define some of the terms used below.

A customer and a subscriber refer to a person or community that buys and uses an intelligent network service.

An operator refers to a person or community that creates a service meeting the requirements set by the customer or subscriber.

A manufacturer refers to a person or community that manufactures the equipment and software with which the operator creates an intelligent network service.

Fast developments in telecommunications have enabled operators to provide various services for users. Network architecture offering advanced services is called an intelligent network, generally abbreviated as IN. IN architecture can be applied to most telecommunication networks, such as Public Switched Telephone Networks PSTN, mobile communication networks, Packet Switched Public Data Networks PSPDN, Integrated Services Digital Networks ISDN and Broadband Integrated Services Digital Networks B-ISDN. Irrespective of the network technology, the object of IN architecture is to facilitate creation, control and management of new teleservices. With regard to present IN specifications, reference is made to Advanced Intelligent Network, Release 1 (AIN Rel.1) by Bellcore and Capability Set 1 (CS-1) by CCITT.

IN architecture is illustrated by fig. 1, in which physical entities are presented as rectangles or circles and functional entities as ovals. Signalling connections are indicated by broken lines, and actual transport, which is e.g. speech, by solid lines. Optional functional entities are indicated by a broken line. The signalling network shown in the figure is a network according to Signalling System No. 7 (SS7, a known signalling system described in the blue book *Specifications of Signalling System No.* 7, Melbourne 1988 of CCITT (now: ITU-T)).

We shall first describe the architecture in the physical plane of an intelligent network. Subscriber Equipment SE, such as a phone, computer or telefax, is switched either directly to a Service Switching Point SSP or to a Network Access Point NAP.

The service switching point SSP offers the user access to the network and takes care of all the necessary selections. The SSP is also able to detect any requests for service in the intelligent network. Operatively, the SSP contains call management and service selection functions.

The network access point NAP is a conventional exchange (e.g. a DX 220 exchange by the applicant) that contains a Call Control Function CCF and is able to distinguish between conventional calls and calls needing the services provided by the intelligent network and to route the latter to the appropriate SSP.

The Service Control Point SCP contains the service logic programs used for providing intelligent network services.

The Service Data Point SDP is a database containing data on the customer and network, the data being used by the service logic programs of the SCP to provide individualized services. The SCP can use the

services of the SDP either directly or through a signalling network.

An Intelligent Peripheral IP provides special-purpose functions, such as announcements and voice and multiple choice detection.

A Service Switching and Control Point SSCP comprises an SCP and an SSP in a single node (i.e. if an SSP node shown in the figure comprises both SCF and SDF entities, it is an SSCP).

The functions of a Service Management Point SMP comprise management of the database (SDP), control and testing of the network, and collection of network information. It can be connected to all other physical entities.

A Service Creation Environment Point SCEP is used for defining, developing and testing the IN services, and for supplying the services to the SMP.

An Adjunct AD corresponds operationally to the service control point SCP but is connected directly to an SSP by a high-speed data link (e.g. ISDN 30B+D connection) rather than through the common channel signalling network SS No. 7.

A Service Node SN can control IN services and transfer data to and from the users. It communicates directly with one or more SSPs.

A Service Management Access Point SMAP is a physical entity that provides certain users with access to the SMP.

To define the function of the different modules in the intelligent network and the restrictions relating to them, the standards (CS-1) also present the intelligent network as a four-plane Intelligent Network Conceptual Model. One layer of the model forms a so-called Distributed Functional Plane DFP, which describes the intelligent network as functional units

in accordance with the above CS-1 standard. The following is a description of these functional units, the locations of which are shown in fig. 1.

The functions relating to call control are SSF, SRF, CCF and CCAF.

A Service Switching Function SSF interconnects a Call Control Function CCF and a Service Control Function SCF by allowing the service control function SCF to control the call control function CCF.

A Specialized Resources Function SRF provides specialized resources needed for implementing IN services. Examples for these are changes in protocol, speech detection, voice messages, etc.

The call control function CCF refers to conventional call and connection establishment. A Call Control Agent Function CCAF provides the user with access to the network.

The functions relating to service control are SCF and SDF. A Service Control Function SCF comprises the IN service logic and attends to service-bound processing. A Service Data Function SDF provides access to service-bound and network information, and allows consistent checking of information. The SDF hides from the SCF the actual implementation of the information and offers the SCF a logical view of the information.

The functions relating to management are a Service Creation Environment Function SCEF, Service Management Function SMF and Service Management Access Function SMAF. The SMF comprises supervision of management, maintenance and location of the services; the SMAF provides a connection to the SMF; and the SCEF makes it possible to define, develop and test IN services and supply them to the SMF.

A request for service made by a calling party typically comprises an act of picking up the receiver

and/or a certain series of numbers. The call control function CCF has no service information, but it is programmed to identify the requests for service. The CCF interrupts the call set-up for a moment and informs the service switching function SSF of the state of the call. The function of the SSF is to interpret the request for service and the information on the state of the call, to form a standardized request for service and to send the request to the SCF. The SCF receives the request and decodes it. After this, it forms, encodes and sends a standardized response to the SSF. The formation of a response may comprise encoding of complicated service logic, starting of a Prompt and Collect Sequence, or a request to different SDFs. The SSF decodes and interprets the response sent by the SCF. It then gives the CCF accurate instructions for performing the preparation process. In accordance with the IN standard CS-1, the call control function CCF always bears full responsibility for the condition and control of local links.

When a response is sent to an SSF, the service control function SCF may have to participate in a conversation between a calling user and an end user. This normally takes place in the form of the above prompt and collect sequence, which the SCF authorizes the SRF to perform. Typically, the SCF instructs the SSF to connect the calling user or end user to a suitable physical source by using the SRF. The source may be e.g. a voice message system. The SCF instructs the SRF in the required prompt and collect sequence and subsequently temporarily 'freezes' the call processing. The SRF activates the prompt and collect sequence and participates in the conversation between the calling user and the end user. The response, which may be e.g. an individual ID number, is encoded and returned to the

SCF, and the voice connection with the SRF is terminated. After this, the SCF continues its service control sequence.

The above is a brief description of an intelligent network offering services implemented in accordance with the present invention. For more specific details, see e.g. the ITU-T recommendations Q.121X or the Bellcore recommendations AIN.

An intelligent network can offer a large number of different services. The services include e.g. freephone and Account Card Calling ACC, which means that the user can phone from any phone to any number by inserting the number and PIN of his credit card before he inserts the telephone number. A graphical user interface for creating IN services is presented in patent application WO 92/11603. In the method of the document, a program record containing desired characteristics is customized separately for each customer, and the record is stored in a database located in the SCP so that it can be called to direct the call when the SSP announces that a predefined trigger condition is met. A situation like this where control of the SCP is required may be e.g. a call destined to or dialled from a specific number. A program record comprises primitives (basic units of a program), which in a graphical user interface are represented by nodes. The operator determines the relations between the primitives by lines connecting the nodes. Each separate graph consisting of nodes and lines connecting them corresponds to a separate program record stored in the database. Problems in this known method are a need for a graphical user interface and the high costs involved in the solution. A subscriber-specific service cannot be created without expensive special equipment and programs by which the graphical

representation of the service is converted into a code executed through an intermediate step and stored in the database. Further, even if two subscribers buy the same service, a separate program record will have to be created for each subscriber. This increases the need for capacity in the database and the work load of the operator.

An improvement to the above method is presented in patent application WO 94/05111, which introduces the concept of a service template. The operator or manufacturer can design a template for the best selling services. When a customer subscribes to a service, the operator creates the service by loading a service according to the template to the display of a graphical user interface and by making such customer-specific additions or modifications to the service that are necessary for creating the service requested by the customer. The service customized in this manner is then converted into a code to be executed and stored in the database of the SCP. Although in the method the operator need not create a service logic program for each customer 'starting from scratch', a separate code-containing program record will have to be created for each customer and stored in the database. The other drawbacks of the earlier method also remain unsolved.

The object of the present invention is to obviate the above drawbacks by providing a new kind of solution that makes it possible to implement customer-specific IN services economically on a large scale. The object is achieved by a method and system provided by the invention, the method being characterized by what is stated in the characterizing part of attached claim 1 and the system being characterized by what is stated in the characterizing part of attached claim 4.

The idea of the invention is to divide a customer- or operator-specific service logic program into two: a general service-specific part and operator- or customer-specific parameters. A solution like this makes it possible for the operator to create a customer-specific service simply by changing or adding customer-specific parameters e.g. by an MML command. The general service-specific part (program code) may be created by the manufacturer or the operator, and it is preferably the same for each customer that has subscribed to the service concerned, since the services are customized customer-specifically simply by modifying the customer-specific parameters. The functionality of the service can thus be modified to be customer- or operator-specific without changing the actual program code at all. No changes are thus necessary in the program code, and yet the customer experiences the service as personal service implemented only for him.

The solution of the invention makes it possible for the operator to implement IN services on a large scale without it being necessary to acquire expensive equipment and software.

Since the operator may use the same basic idea of the invention to create different variations of the same service for its own operation, the method does not relate solely to production of customer- or subscriber-specific services but the operator may also create different variations for its own internal use only. A solution like this is characterized by what is disclosed in the characterizing part of attached claim 6.

In the following, the invention and its preferred embodiments will be described in greater detail with reference to the examples of the attached drawings, in which

fig. 1 illustrates IN architecture,

fig. 2 is a block diagram showing the elements by which the service provided by the invention is triggered,

fig. 3 (divided into figures 3a and 3b) is a flow diagram illustrating implementation of a "Follow Me" service in accordance with the invention,

fig. 4 illustrates the division of a service logic program into two, and customization of a service by an operator in a system according to a first embodiment of the invention, and

fig. 5 illustrates a system according to a second embodiment of the invention.

In the following description of the method of the invention, implementation of a "Follow Me" service will be used as an example. A Follow Me service is a service similar to conventional call forwarding, enabling the customer to redirect the calls addressed to his access point to any other access point (destination access point) of the telephone network. A conventional call forwarding procedure can be activated only from the subscriber's own access point. The activation is performed by picking up the receiver and dialling a predefined code that activates the call forwarding procedure, e.g. by dialling *21*XXXXXX#, where XXXXXX is the telephone number of the destination. A Follow Me service implemented by IN architecture, in turn, can be triggered from any access point whatsoever by making a call to a predefined directory number (e.g. 9800-2121) reserved for activation and passivation of IN services. The dialling of the number triggers the CCF/SSF to send a message to the SCF responsible for the activation and passivation of IN services. On the basis of the message the SCF

loads the appropriate service logic program from the database for execution.

The correct program to be started is found on the basis of the number dialled by the subscriber, appearing from the message send by the CCF/SSF to the SCF. The following is a more detailed description of the operations performed in connection with the start-up. Reference is made to fig. 2, which shows the elements by which the program located in the database is started so as to implement a service. First the SCF receives a message from the CCF/SSF identifying the program to be started. If the CCF/SSF and the SCF are located in different network elements (SSP and SCP), the messages pass through program block ENCODE/DECODE, which modifies the INAP messages according to the recommendations as internal messages intelligible to the programs. [In communicating with each other, the SSP and SCP use the INAP protocol described in ETSI IN CS1 INAP Part 1: Protocol Specification, Draft prETS 30 374-1, November 1993. In the SS7 protocol pile, the INAP layer is the topmost layer, and beneath it are the TCAP layer (Transaction Capabilities Application Part), SCCP layer (Signalling Connection Control Point) and MTP layer (Message Transfer Part).] If, on the other hand, the CCF/SSF and SCF are located in the same network element (which is e.g. a service node SN, cf. fig. 1), no modification (program block ENCODE/DECODE) is needed but the messages may be internal of the network element. Program block ENCODE/DECODE is thus an optional block that modifies the protocol where necessary.

The transmitted message identifying the service logic program is received by program block IDX, which is the block implementing the SCF in the network element. After receiving the message, block IDX

duplicates the interpreter program INTERPRETER, and the copy reads a program record to be interpreted from the database (e.g. DB1) (the databases belong to the SDF). After this, the interpreter program INTERPRETER starts to interpret the program command by command. (Storage of a program in code form and its interpretation during the execution are previously known e.g. from programming language BASIC. The use of a separate interpreter is advantageous, since new versions of the programs of a network element are then easier to put into use (since the interpreter is already there, only updating of program records is needed).

When the interpreter program INTERPRETER has proceeded in the execution of the program to a point where it is necessary to send messages to the CCF/SSF or SRF, INTERPRETER performs the transmission either directly (the message then being internal of the network element) or through program block ENCODE/DECODE (separate SSP and SCP) and waits for a response. After this, intervention of program block IDX is no longer needed but the other party (which is either the CCF/SSF in the service node SN or block ENCODE/DECODE if the SSP and SCP are separate) is from then on able to communicate directly with the appropriate copy of INTERPRETER. Several copies of program block INTERPRETER may exist at the same time, each copy interpreting a separate program. When the INTERPRETER has proceeded in the interpretation of the program to a command that requires cooperation with the SDF, it performs a database operation (e.g. read or write) in a database that is either the same (DB1) as or different (DB2...DBn) from the database that the program record to be interpreter was read from.

The following is a detailed description of implementation of a Follow Me service according to the

invention. Reference is made to the flow diagram of figures 3a and 3b, where the basic units (primitives) of the program are indicated by rectangular nodes and quadrangles standing on a vertex, the units being typically implemented by Service Independent Blocks SIB defined in the ITU-T recommendations. The rectangular nodes are facility nodes, and the quadrangles standing on a vertex are decision (condition) nodes. A facility node corresponds to a part of a program where an operation of a service is performed, e.g. a voice message is read to the subscriber and additional selection information is collected. A decision node, in turn, corresponds to a part of a program where one of several possible alternatives is selected in the execution of the program in accordance with the parameters concerning the call and service. The arrows to and from the left of the flow diagram stand for the conversation carried out by the program with the SSF/CCF (cf. fig. 2). The arrows to and from the right of the flow diagram, in turn, stand for the read operations executed from the database (e.g. DB1, fig. 2) and/or write operations executed to the database by the program.

The circle in the flow diagram corresponds to a part of a program according to the invention in which the subscriber-specific parameters defined in the service logic program for this particular subscriber can be requested from the database. The part of the program represented by the circle is from now on called a point. In the invention, certain well-defined points are added to the service logic program, and certain functional characteristics can be associated with these points. The points are identified on the basis of an identifier code. The code is a consecutive number within the service logic program, the number being

transmitted in connection with certain commands. At a point, the subscriber-specific information to be retrieved can be identified by any identifier identifying the subscriber, e.g. by a subscriber identifier or the subscriber's telephone number.

Immediately after the start-up, the program proceeds to point 1, where it reads from the database a record defined unambiguously on the basis of a service logic program identifier, serial number of the point, service facility and subscriber identity. Since at this stage of the execution of the program, the desired service facility and the subscriber identity are not yet known, the service logic program uses a default value instead, whereby a general record corresponding to the first point of the service logic program is read. In the exemplary embodiment of the invention, the record to be read contains the fields 'announcement parameter', 'clearcode parameter', 'counter parameter' and 'alarm parameter'.

The 'announcement parameter' informs the subscriber of the announcement to be read next. The 'clearcode parameter' indicates the clearcode to be stored if the execution of the program is incorrectly interrupted after this point but before the next point. The 'counter parameter' indicates the counter the value of which is added by one by the execution of this part of the program. The 'alarm parameter' identifies the alarm that is requested from this part of the program. The record to be read may also comprise other parameters, such as 'time parameter' or 'destination number parameter', or any other variable that influences the execution of the program and can be turned into a parameter.

User interrogation 1 (step 41) following point 1 forms and sends the CCF/SSF a message indicating the

announcement parameter that has been read last. On the basis of this, the CCF/SSF plays the announcement corresponding to the announcement parameter to the subscriber. An announcement like this may be, for example: 'Please enter a facility code'. When the subscriber wants to activate the Follow Me service, he then keys the appropriate activation code, e.g. *44*, and when he wants to passivate the Follow Me service, he keys the passivation code, e.g. *44#. Each service that can be controlled by the subscriber corresponds to a certain predefined code that can be keyed in via the push buttons of the telephone in order to activate or passivate the service as desired.

The CCF/SSF receives the selection information given by the subscriber and sends a message containing an analysis result back to the service logic program. From the message received, the service logic program reads the service identifier and the mode of use of the service (activation/passivation), and proceeds to study the service identifier (step 42). If the service identifier corresponds to the identifier of the Follow Me service, the execution of the program will be continued in the Follow Me branch (the beginning of which is indicated by a horizontal broken line). If the service identifier corresponds to some other service, the execution of the program will be continued in the branch corresponding to the identifier concerned (shown in block 'other services').

If the service identifier received is an identifier corresponding to the Follow Me service, then the program will proceed to point 2, where the program reads a predefined record from the database, the 'announcement parameter' of the record informing the subscriber of the announcement to be read next.

Point 2 is followed by user interrogation 2 (step 43), in which the service logic program sends the CCF/SSF a message indicating the last-read announcement parameter. Here the announcement made to the subscriber may be, for example: 'You wish to activate the Follow Me service. Please enter password*own directory number*destination number#'. The response given by the subscriber informs the program of the subscriber's password and directory number and of the desired destination number. After receiving the information, the program proceeds to database interrogation 1 (step 44), where it reads from the database the information on the subscriber found on the basis of the subscriber's directory number. The information may contain, for example, information on any additional services subscribed to, the state (active/passive) of such services, the mode of operation of the subscriber line and the password set.

After the database interrogation, the program checks (step 45) the subscriber information to see whether the subscriber is authorized to use the Follow Me service. If he has no authorization, the program proceeds to point 3, where it reads (not shown in the figure) the record indicating the announcement to be played next to the subscriber, in other words the record that corresponds to point 3 of the service logic program. After point 3 (after the announcement), the program interrupts the execution prematurely. Always in a situation like this where a service logic program is interrupted prematurely, the announcement indicated by the last-read announcement parameter is played to the subscriber.

If the subscriber is authorized to use the Follow Me service, the program checks (step 46) whether the subscriber line is active. If the line is not

active, e.g. due to unpaid bills, the program reads the parameters contained in the record defined at point 4 and interrupts the execution prematurely after playing the announcement.

If the subscriber line is active, the program checks (step 47) whether the highest allowed number (Ymax) of service activation/passivation attempts (Y) has been achieved. If yes, the program reads the parameters contained in the record defined at point 5 and interrupts the execution prematurely after playing the announcement.

If the program allows the subscriber to try and activate/passivate the service at least once more, the program checks (step 48) whether the password entered by the subscriber is the same as the password read from the database. If not, the program adds the number of failed attempts by one and proceeds through point 6 to user interrogation 2 (step 43), which plays an announcement defined at point 6 to the subscriber, the announcement being, for example: "The directory number entered does not match with the password. Please enter: password*your own directory number*destination number#".

If the password is found correct, the program tests (step 49) whether the procedure concerned is activation or passivation of service. If it is service passivation, the program proceeds to database writing 1 (step 49a), which deactivates the service. The program then moves through point 7 to user interrogation 4 (described below). If the procedure is service activation, the program proceeds through point 8 to user interrogation 3 (step 50). In user interrogation 3, a personal announcement indicated at point 8 is read to the subscriber, for example: 'Hello, Mikko Honkanen, what number do you want to transfer

your calls to?' In response to user interrogation 3, the program receives the destination number given by the subscriber, and in the database writing step 2 (step 51), the number is stored in the database containing the subscriber information. After the writing, the program proceeds through point 9 to user interrogation 4 (step 52).

User interrogation 4 reads an announcement concerning successful activation/passivation to the subscriber at point 7 or 9, after which the program stores the information needed for charging and terminates the execution.

When the Follow Me service is activated and the subscriber's directory number is called, the CCF/SSF sends the SCF a request for service, in response to which the SCF sends the CCF/SSF the destination number to which the subscriber wants his calls to be routed.

The present invention makes it possible to implement an IN service such that either the manufacturer or the operator creates, in accordance with the invention, a general service logic program that is common to several subscribers and also creates, in a separate database or table, the subscriber-specific information that the program reads during the execution. Fig. 4 illustrates division of the service logic program into two and the service customization (typically) performed by the operator. A service logic program 400 common to several subscribers is here stored in database DB2 of the network element, fig. 4 showing a small portion (associated with point 2) of the commands of the program read by the INTERPRETER. When the program proceeds to point 2 (point (2); the service logic program code shows, at this point, identifier L2, which stands for a jump address), the

'customization information' stored in database DB3 is searched (arrow 401) for information on the subscriber concerned (here subscriber number 2), the information being exemplified in the figure by an announcement code and a clearcode. The execution of the program is then continued using (where necessary) the codes concerned, i.e. in the example of fig. 4 the announcement identified by the earlier-read announcement code is used in the announcement command (ANNOUNCEMENT), and when the call has to be cleared (command CLEAR), the clearing method identified by the last-read clearcode is used.

In the example of fig. 4, the information defining the appearance of the service implemented by a common service code to each reader is stored in database DB3. The information thus defines how the same service appears to each end user (subscriber or operator). The system of the invention thus comprises one service logic program for implementing a certain service and additionally some data, and together they give the impression that each subscriber has his own personal program.

In the above manner, the operator can customize customer- or operator-specific services by deleting, adding or modifying data of separately stored records that influence the execution of the service logic program. The system is made particularly advantageous by the fact that the actual service logic program remains intact, whereby no programming, neither manual nor visual, is needed with a graphical user interface. The subscriber-specific 'customization information' can be changed by the operator e.g. by command language MML (Man-Machine Language), the I/O syntax of which is defined in the ITU-T (previously CCITT) recommendations Z.317-Z.341. Here the operator

gives MML commands from a data terminal (DT, fig. 4) located at an exchange or further away, and the commands change the desired parameters of the desired subscriber.

The operator can also use the above principle for internal purposes by creating different variations of the same service by different customization information. The operator can, for example, create variations with different charging methods from the same service by connecting counters to certain points, the counters stepping forward when the execution of the program passes the point concerned. All the information of the actual service logic program stored separately is here information on the operator concerned, the information being divided into different units, each of which is associated with a certain variation of the service concerned. A system according to an embodiment like this is illustrated in fig. 5, which corresponds to the system of fig. 4 with the exception that the customization information 501 stored in database DB3 is here variation-specific information.

The counters associated with points also help the operator to collect various statistics. The operator, for example, may be interested in how many times a program passes through a certain branch, that is, e.g. how many subscribers call within a certain interval using an incorrect Person Identification Number PIN. Instead of a statistical counter, the operator may also connect e.g. an alarm to a point. The customization information retrieved at a point of the service logic program can here be identified solely on the basis of an identifier and a point of the service logic program, or a service identifier and point.

Although the invention is described above with reference to the examples illustrated in the attached

drawings, it is obvious that the invention is not limited thereto but can be modified within the scope of the inventive idea presented above and in the attached claims. The customer- or operator-specific information may even be located in another network element than the general service logic program if they are connected by a sufficiently high-speed link. The only essential feature, however, is that the 'customization information' is stored separately from the actual program code as subscriber-specific information. It should also be noted that, depending on the service, production of a service in the attached claims may mean e.g. activation/passivation of a service (as above) or use of a service after the activation.

Claims

1. A method of providing a subscriber-specific service by an intelligent network; in the method, a service logic program is stored in the database (DB1, DB2) of the intelligent network and a subscriber-specific service is produced by starting said service logic program in response to a predefined trigger condition, c h a r a c t e r i z e d by

implementing the service logic program as a service logic program (400) common to a plurality of subscribers,

storing subscriber-specific information concerning the service for each subscriber separately from said service logic program, and

determining points in the service logic program from which the program reads, during the execution, subscriber-specific information on an individual subscriber, whereby the execution of the common service logic program with the read subscriber-specific information provides said subscriber-specific service.

2. A method according to claim 1, c h a r a c t e r i z e d in that the service logic program (400) is stored in a different database from the subscriber-specific information.

3. A method according to claim 1, c h a r a c t e r i z e d in that subscriber-specific information is changed by command language MML known per se.

4. A system of producing a subscriber-specific service by an intelligent network, the system comprising a service logic program stored in a database (DB1, DB2) of the intelligent network, the service

being able to be triggered in response to a predefined trigger condition, c h a r a c t e r i z e d in that

the service logic program (400) is implemented as a service logic program common to a plurality of subscribers,

subscriber-specific information concerning the service is stored for each subscriber separately from said service logic program, and

in the common service logic program there are stored points from which the program reads, during the execution, subscriber-specific information on an individual subscriber, whereby the execution of the service logic program with the read subscriber-specific information provides said subscriber-specific service.

5. A system according to claim 4, c h a r a c t e r i z e d in that the service logic program (400) is stored in a different database from the subscriber-specific information.

6. A method of producing a customized service by an intelligent network; in the method, a service logic program is stored in a database (DB1, DB2) of the intelligent network and a customized service is produced by starting said service logic program in response to a predefined trigger condition, c h a r a c t e r i z e d by

implementing the service logic program as a general service logic program (400) common to different variations of the service concerned,

storing, for each variation, customizing information on the service separately from said service logic program, and

defining points in the service logic program from which the program reads, during the execution, customizing information on an individual variation, whereby the execution of the service logic program with

the read customizing information provides a variation of said service.

7. A method according to claim 6, characterized in that the service logic program (400) is stored in a different database from the customizing information on different variations.

8. A method according to claim 6, characterized in that the customizing information is changed by command language MML known per se.

9. A system of producing a customized service by an intelligent network, the system comprising a service logic program stored in a database (DB1, DB2) of the intelligent network, the program being able to be started in response to a predefined trigger condition, characterized in that

the service logic program (400) is implemented as a service logic program common to a plurality of service variations,

for each service variation, the customizing information concerning the service is stored separately from said service logic program, and

in the common service logic program there are defined points from which the program reads, during the execution, customizing information on an individual variation, whereby the execution of the service logic program with the read customizing information provides a variation of said service.

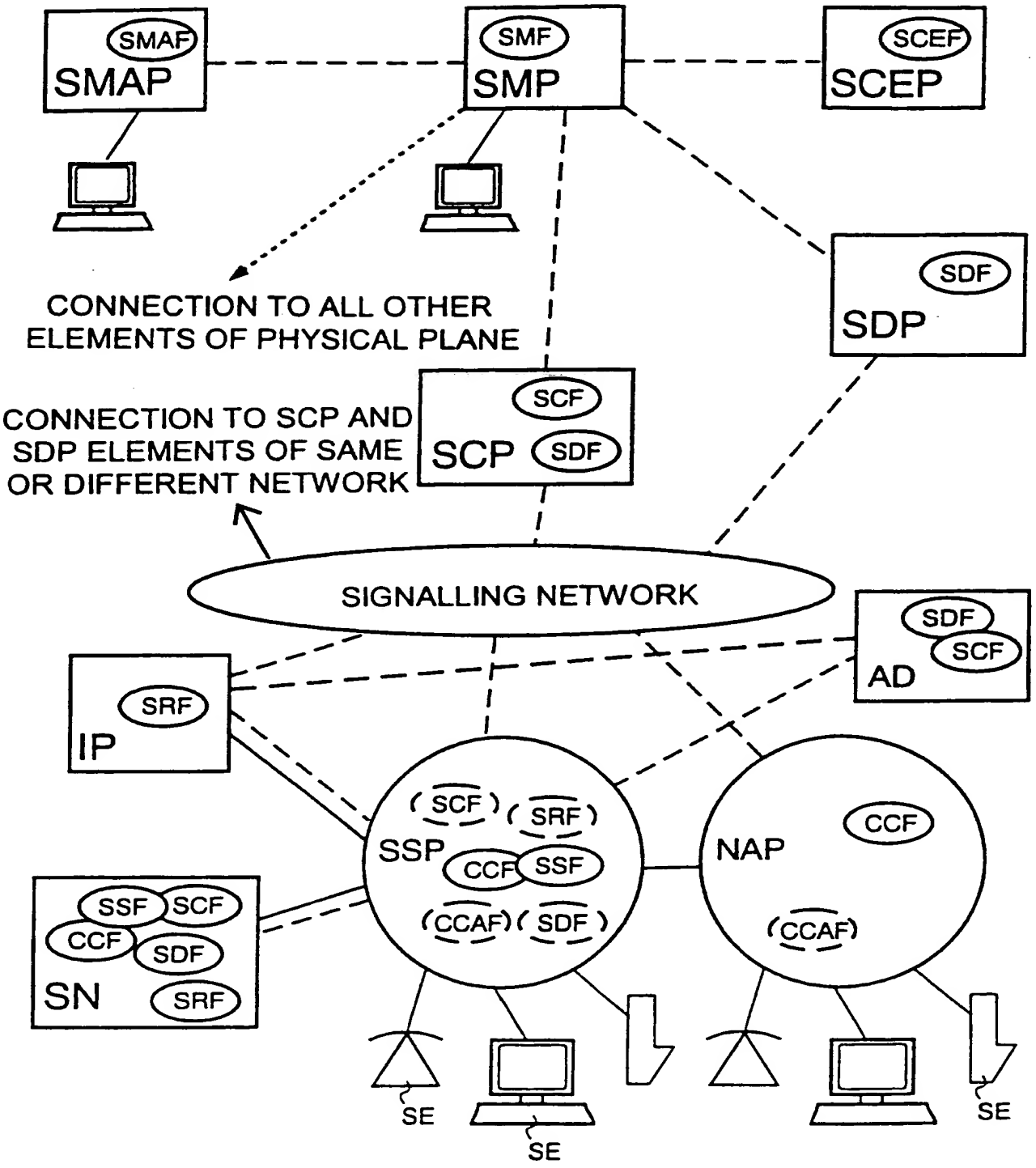
SMAF
SMAP
SMF
SMP
SCEF
SCEP
CONNECTION TO ALL OTHER ELEMENTS OF PHYSICAL PLANE
SDF
SDP
CONNECTION TO SCP AND SDP ELEMENTS OF SAME OR DIFFERENT NETWORK
SCF
SCP
SDF
SIGNALLING NETWORK
SDF
SCF
AD
SRF
IP
SCF
SRF
SSP
CCF
SSF
CCAF
SDF
CCF
NAP
CCAF
SSF
SCF
CCF
SDF
SN
SRF
SE
SE
SE

Fig. 1

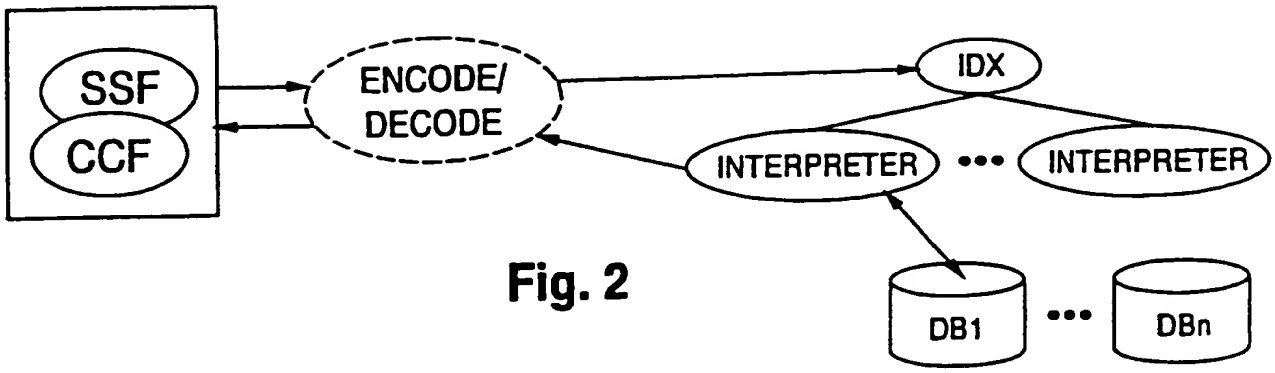
SSF
CCF
ENCODE/
DECODE
IDX
INTERPRETER
INTERPRETER
DB1
DBn

Fig. 2

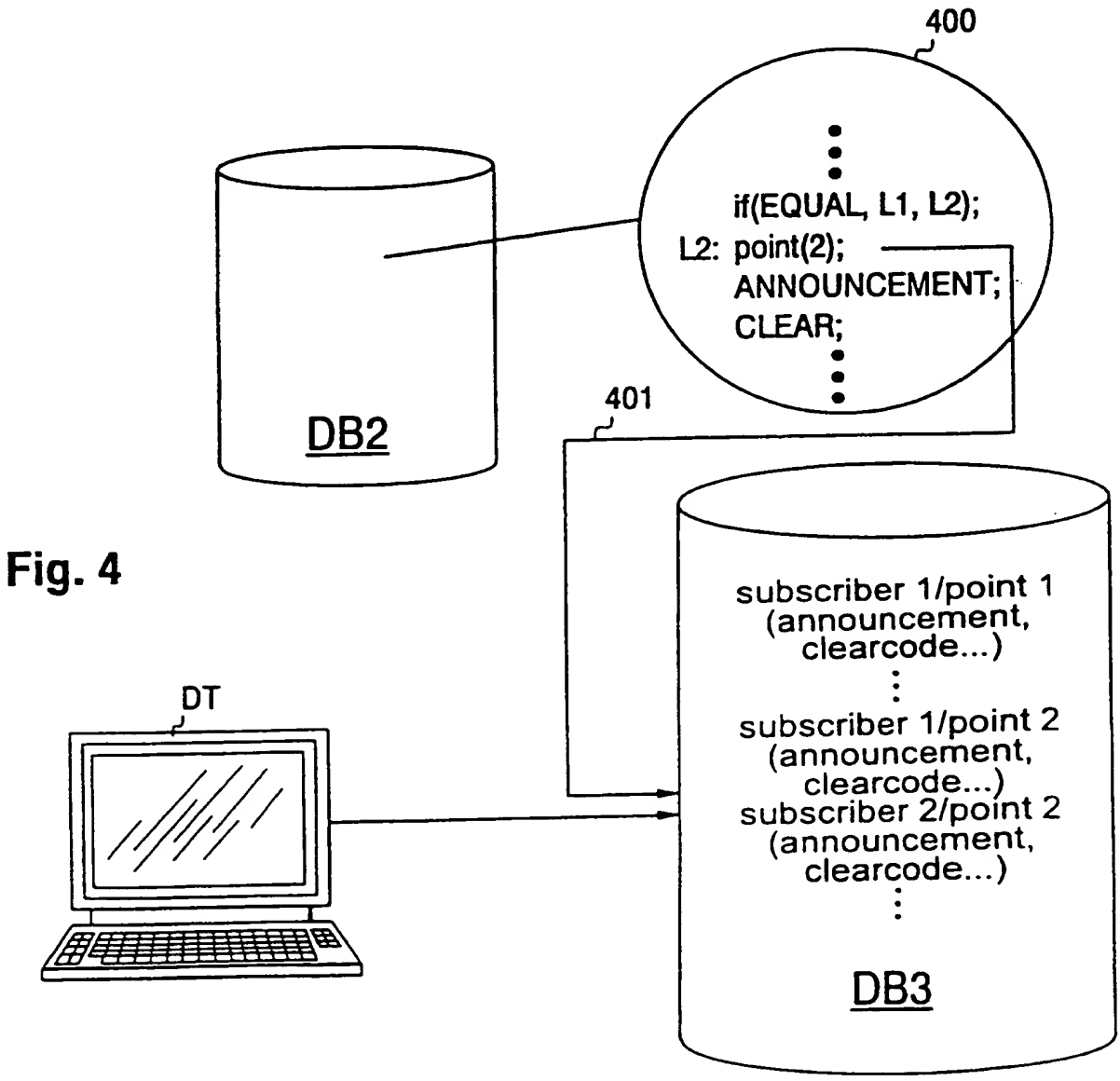
400
if(EQUAL, L1, L2);
L2: point(2);
ANNOUNCEMENT;
CLEAR;
DB2
401
DT
subscriber 1/point 1
(announcement,
clearcode...)
subscriber 1/point 2
(announcement,
clearcode...)
subscriber 2/point 2
(announcement,
clearcode...)
DB3

Fig. 4

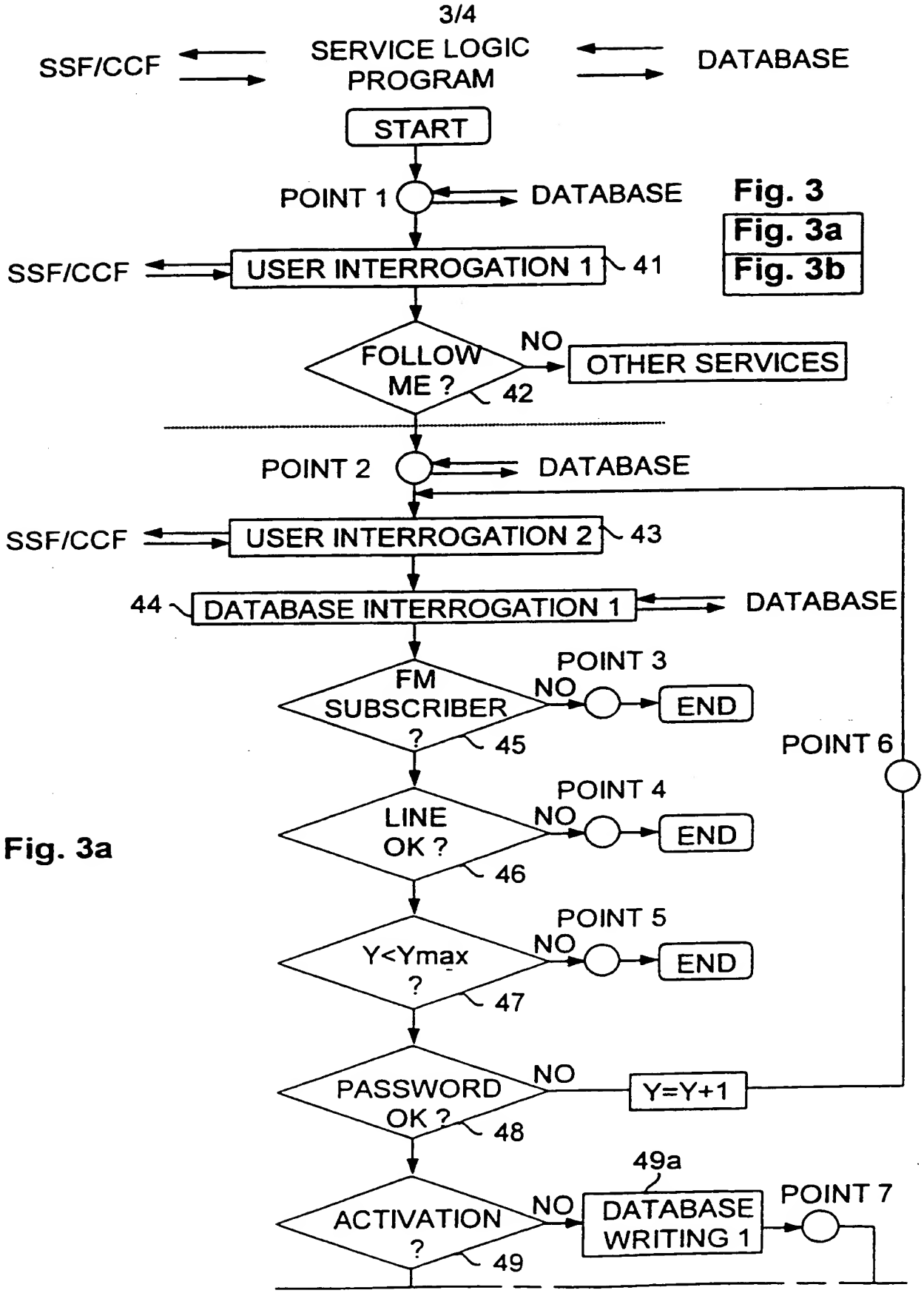

Fig. 3

Fig. 3a

Fig. 3b

Fig. 3a

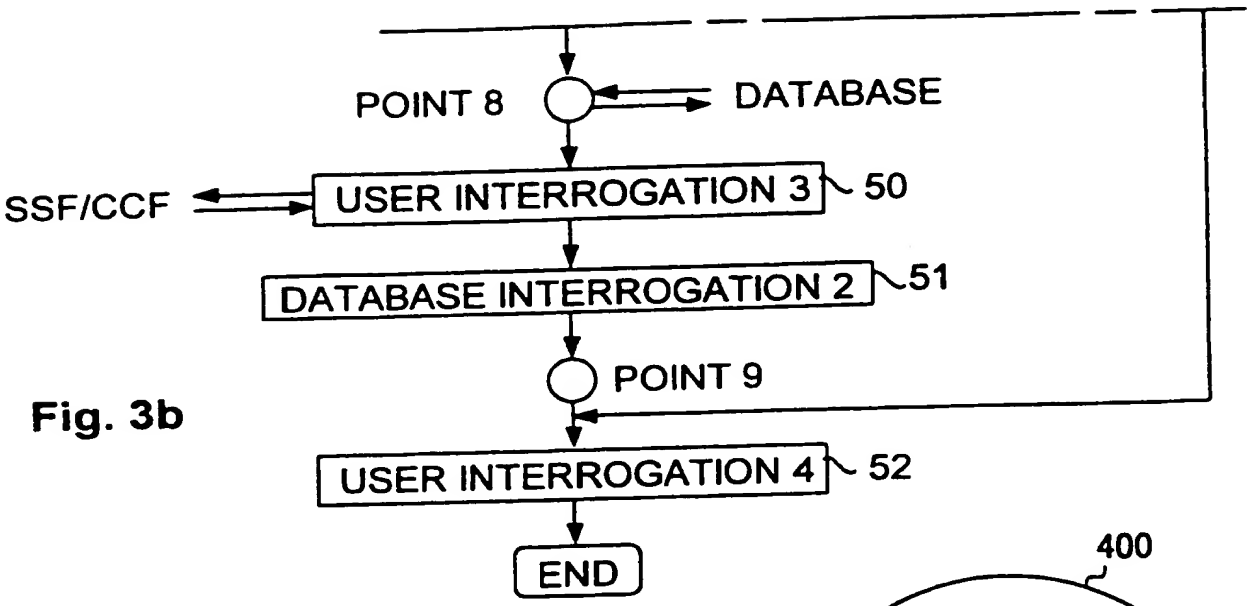
POINT 8
DATABASE
SSF/CCF
USER INTERROGATION 3
50
DATABASE INTERROGATION 2
51
POINT 9
USER INTERROGATION 4
52
END

Fig. 3b

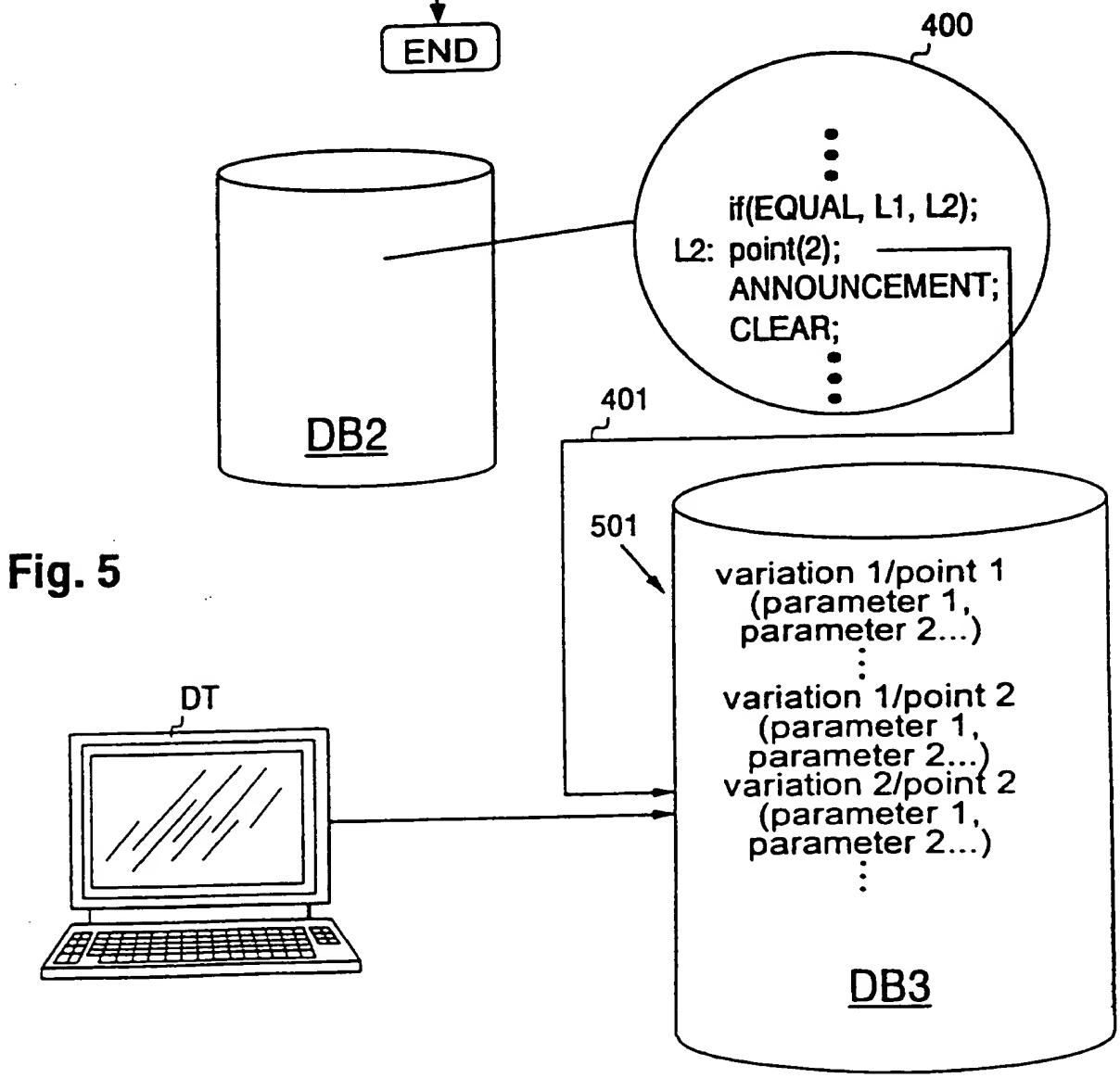
400
if(EQUAL, L1, L2);
L2: point(2);
ANNOUNCEMENT;
CLEAR;
DB2
401
501
variation 1/point 1
(parameter 1,
parameter 2...)
variation 1/point 2
(parameter 1,
parameter 2...)
variation 2/point 2
(parameter 1,
parameter 2...)
DT
DB3

Fig. 5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/FI 96/00180

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: H04Q 3/00
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 9211724 A1 (BELL COMMUNICATIONS RESEARCH, INC.), 9 July 1992 (09.07.92), page 5, line 30 - page 6, line 4; page 6, line 30 - page 7, line 5	1-9
P,A	EP 0651548 A1 (AT & T CORP), 3 May 1995 (03.05.95), abstract	1-9
A	US 5377186 A (D.C. WEGNER ET AL), 27 December 1994 (27.12.94), column 7, line 56 - column 8, line 10; column 8, line 40 - line 44, abstract	1-9

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" erlier document but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
14 August 1996	15 -08- 1996
Name and mailing address of the ISA: Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. + 46 8 666 02 86	Authorized officer Göran Magnusson Telephone No. + 46 8 782 25 00

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Information on patent family members

31/07/96

International application No.
PCT/FI 96/00180

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO-A1- 9211724	09/07/92	AU-A- 9177791	22/07/92
		CA-A- 2098607	19/06/92
		EP-A,A,A 0563319	06/10/93
		JP-T- 6502752	24/03/94
		US-A- 5323452	21/06/94
EP-A1- 0651548	03/05/95	NONE	
US-A- 5377186	27/12/94	CA-A- 2128295	22/01/95